Pop-Up Geometry

Kit contains:

- 1 dodecahedron net
- 1 sheet of cardboard
- 2 beads
- string

You will need: scissors, a nail, and a holepunch (optional but helpful).

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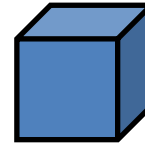
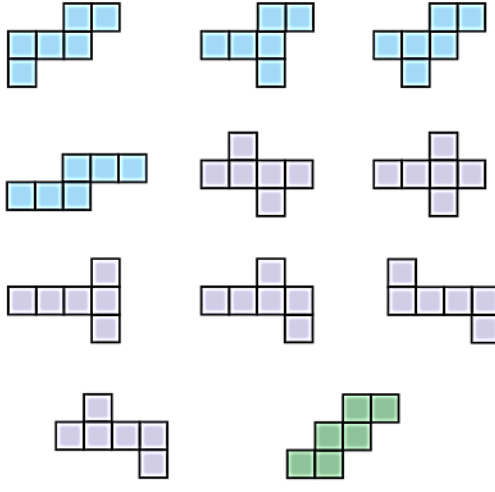
THE MATH: Before creating the greatest pop-up ever, we need to discuss nets. Picture a 3-dimensional shape, like a cube. Now imagine that it's hollow. If we unfold the cube to create a 2-dimensional diagram of its faces, we get the **net**.



There can be many nets for a single 3-D polyhedron. A cube has 11 of them!



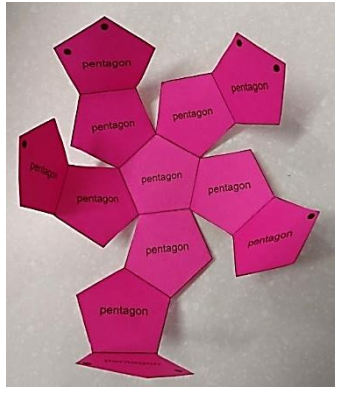
Now it's time take a net made up of 12 identical **regular** pentagons — this means that all of the angles are the same size and all of the sides are the same length — and build a mechanism that pops it into a dodecahedron.

INSTRUCTIONS

Step 1: Cut out the dodecahedron net. Be sure to take note of the numbering.

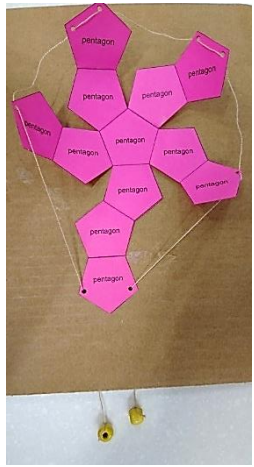
Step 2: Fold and crease the pentagons along the solid edges.

Step 3: Glue the indicated pentagon to the corrugated cardboard sheet. Leave the rest loose.



Step 4: Punch the holes in the net. (Yes, you do need to punch through the cardboard layer on the glued face. This is why you have a nail.)

Step 5: Thread the pull string through the holes: up through the odd holes and down through the even holes as labeled on the template.



Step 6: Tie the beads to the ends of the string.

When you pull the strings, the 2-dimensional net pops up into a 3-dimensional polyhedron. Ta-da!